APPENDIX E

POTENTIAL CHANGED CONDITIONS REPORT

Potential Changed Conditions

The BLM and FS considered whether large wildland fires, floods, drought, or other unusual weather patterns occurring since 1994 changed the Affected Environment described in FEMAT or the Northwest Forest Plan Final SEIS. These natural episodic disturbance events are an integral part of process-based management contained in the Aquatic Conservation Strategy. As stated in the FEMAT report (page V-29) and the Northwest Forest Plan FSEIS (page B-81):

> "The heart of the approach is the recognition that fish and aquatic organisms evolved within a dynamic environment."

Wildland and Prescribed Fire

Over the Northwest Forest Plan area, wildfire has been the most frequent and widespread, coarse-scale disturbance event. Fire return intervals are highly variable throughout the area and range from as much as 400 - 500 years in the Mount Rainier National Park to as little as every three to four years in dry, eastside pine areas of northern California. Wildfires can also cover as little area as a lightening struck tree and as much as 250,000 acres, and rarely as large as the 2002 Biscuit Fire, which covered half a million acres.

Wildfire has always played a role in forming the landscapes of the Northwest. Many species are dependent upon fire for habitat formation, regeneration processes and forage production. However, well-intentioned suppression activities over the last 80 to 100 years have altered stand structures and composition in low-elevation forests. That alteration has shifted the fire frequency and intensity patterns of both eastside and westside forests. Overall, more fires are larger, more intense, and more difficult to control. About 1 percent of all wildfires in the west are responsible for about 98 percent of all areas burned (Straus and others, 1989). [Insert data, citation] Fire suppression is believed to have stretched the fire return interval in areas that historically averaged a fire every seven years to one every forty years (Lehmkuhl, cite). Fewer low-intensity fires cover large areas – they are easier to control and more likely to extinguish on their own. Suppression strategies for the more intense fires are both dangerous and expensive. The FEMAT report (p. III-35) states:

> "… large-scale disturbances are natural events, such as fire, that can eliminate owl habitat on hundreds of acres. Certain risk management activities, if properly

> planned and implemented, may reduce the probability of these major stand-replacing events. There is considerable risk of such events in Late-Successional Forest Reserves in the eastern Oregon Cascades, eastern Washington Cascades, and California Cascades provinces and a lesser risk in the Oregon Klamath and California Klamath provinces. Elevated risk levels are attributed to changes in the characteristics and distribution of the mixed conifer forests resulting from past fire protection."

The changing patterns in fire behavior have been known for some time. The 1988 Yellowstone National Park fires served to bring the issue into sharp focus. Although paleo-ecological records indicated that fires of this magnitude had occurred in the area over the last, much of the public, many land managers and decision-makers seemed relatively unaware of the probabilities of fires of this magnitude. These large-scale events (over 5,000 square kilometers) occurred very infrequently and had a periodicity far longer than the average person's lifetime. Although the extreme wildfire events of the 2000 and 2002 fire season have left us with strong reminders of the shifts in our landscape, the possibility was well known during the development of the FEMAT analysis and FSEIS effects analysis of the Northwest Forest Plan. The FEMAT report cites literature by Jerry Franklin and Tom Spies from 1984 that estimates similar fire frequencies and behaviors. One of the primary limitations in the FEMAT analysis of the probabilities of developing late-successional and old growth conditions was fire behavior. FEMAT states (pp IV-72) that:

> "The probabilities of large-scale disturbances and other environmental changes during the next 100 years are high. The region has historically been subjected to large fires …"

Prescribed fire has been adopted as a mechanism of simulating the less intense fires that were more extensive and frequent in the past. Prescribed fires generally leave more naturally patchy burn areas with much greater overstory retention. They help eliminate ground fuels to reduce the risks and hazards of allowing natural wildfires to run their course.

As mentioned elsewhere in references to the development of the ACS, the framers of the Northwest Forest Plan focused on disturbance ecology as a central organizing principle. They were well aware of the role that disturbances play in forming our landscapes, creating wildlife habitat, and affecting the distribution and abundance of organisms. They also showed a profound understanding of the relevance of scale to developing and maintaining a long-term conservation and sustainable production strategy.

The Northwest Plan framers translated that understanding into eleven terrestrial objectives and nine Aquatic Conservation Strategy objectives. Terrestrial objective nine addressed the concern with managing large-scale disturbances such as wildfire:

> "To reduce risk to late-successional ecosystems resulting from large-scale disturbances and unacceptable loss of habitat due to large-scale fire, insects, and disease and major human impacts."

Terrestrial objective 7 also refers to natural processes that would include fire:

> "To maintain ecological processes, including those natural changes that are essential for the development and maintenance of late-successional and old-growth ecosystems."

Many of the plan objectives apply to larger-scale features. These features may only be monitored at larger scales than that of the 26 individual planning units that are under the Forest Plan. Large-scale fire events are one good example of the type of event intended to be monitored and managed at the larger, regional scale.

Through combinations of dendrochronology, sediment charcoal and pollen and fossil records, we have a large-scale record of fire history over thousands of years. Looking at ten sampling areas throughout the Pacific Northwest, Dr. Fred Swanson at the Pacific Southwest Research Station in Corvallis has established that the 1500s and the 1800's were both considered periods of intensive fire. The 1600's, 1700s and 1900s were centuries that experienced relatively less wildfire in the area. He also believes that major fire events occurred both 450 years ago and 125 years ago. Because of the long periodicity of wildfire events and cycles, the eight years that have passed since the signing of the Forest Plan are insufficient to evaluate whether or not we are outside the scope of the effects analysis of the FSEIS. Although the fire years of 2000 and 2002 were costly, catastrophic and dramatic, they are insufficient to establish a fire regime substantially different than that of eight years ago as analyzed under the Northwest Forest Plan. Fires since 1994 do not change the planning assumptions or effects analysis presented in the Northwest Forest Plan and associated reports, particularly those assumptions relevant to this SEIS.

Floods

Flooding is recognized as part of a natural landscape disturbance regime. Floods transport and redistribute wood and sediment unevenly throughout the channel network (FEMAT, V-13). The terms "peak flow" and "flood" are often used interchangeably; public perception tending to associate the term "floods" with rare catastrophic events.

Floods are important disturbances that provide for the formation of complex habitats as material is transported through the stream network during high flows. The formation of complex habitat is dependant on a full range of flow and processes like landslides to provide sediment and wood for transport. Benda (1998) and others have demonstrated that peak flows (winter floods) that occur approximately one out of three years can move landslide-derived sediment downstream. Floods large enough to transport wood may occur frequently, but transport of wood depends on the wood supply and topography (Nakamura and Swanson, 1993).

Flood frequency and magnitude is variable over time and large catastrophic floods can happen during any year. The actual number of years between floods of any given size varies as climate varies. The term "100 year flood" can lead people to believe that a large flood can happen only once every 100 years. Actually the term is really a statistical designation, meaning there is a "1-in-100 chance" that a flood this size will happen during any year (USGS, 1996). Probability estimates improve each year that records are kept.

Numerous major floods have occurred across the Northwest Forest Plan area since 1994. Four major storm events were considered "100-year floods" in 1995 and 1996. More than one "100-year flood" occurred in the same sub-basins in successive or nearly successive years (USGS 1998).

None of the major floods occurring since 1994 were caused by dam failure or other human activity. Floods in the area often occur during an El Nino weather pattern, which are associated with warm and wet conditions. During these periods the area can be subject to intense flows of constant moisture from the Hawaiian Island chain that is known as the "pineapple connection." These set the stage for many floods including those that have occurred since 1994.

The agencies stepped up restoration activities in response to major floods in 1996 and 1997. Project accomplishments included:

- 3500 miles of stabilized roads,
- 60 miles of relocated roads,
- 900 miles of decommissioned roads
- over 200 upgraded road/stream crossings

Source: USDA, Recovery Report, Floods of 1996-1997.

Major floods were discussed in the Northwest Forest Plan FSEIS and FEMAT. The Proposed Action does not change the requirement to consider the role of peak flows and flooding in forming aquatic habitat nor the appropriate responses in the event of a flood. In both alternatives, the Watershed Analysis would need to consider the effects of floods at the watershed and larger scales in terms of restoration needs and adaptive management. Future restoration projects would need to comply with standards and guidelines and where appropriate, adapt new methods learned from these recent episodic events.

Drought

Drought is a normal, recurrent feature of climate and can be considered a natural "disturbance" even in humid areas. The frequency of droughts in the northwest depends on variable climatic conditions that appear to follow El Nino trends, especially north of Roseburg, Oregon (Taylor, 1988).

Drought is typical within the Northwest Forest Plan area, however the frequency, severity and duration of droughts in the Northwest Forest Plan area have varied dramatically over the last hundred years. NOAA records show that some part of the Pacific Northwest experiences a drought in 75 out of a 100-year period.

Just as with floods and wildland fires, FEMAT acknowledged droughts as natural catastrophes, which would occur periodically over long time periods (FEMAT V-I)

El Nino

El Nino events have been recorded seven times since 1940, including 1997-98. There is nearly 100 percent probability that moderate El Nino conditions will continue for the first quarter of 2003 (NOAA International Research Institute For Climate Prediction) and Pacific salmon and steelhead will continue be impacted by ocean conditions generated by broad scale weather patterns.

Anomalous warm sea surface temperatures and changes in costal currents and upwelling characterize El Nino ocean conditions. Principal ecosystem alterations include deceased food base productivity and changes in prey and predator species distribution. Increased mortalities and reduced growth have been noted in Pacific salmon populations off Oregon and Washington after previous El Nino events (NOAA 2000).

The ACS does not address ocean conditions affected by El Nino events, but rather, strives to maintain and restore freshwater habitats. Large weather patterns and ocean conditions are not affected by the Proposed Action and are therefore not relevant to the decision to be made.

Relationship Between Wildfires, Floods, Droughts and El Nino (Potential Changed Conditions) to the Decision to be Made

The events occurring since 1994 are not considered changed conditions that would invalidate the four components of the Aquatic Conservation Strategy (watershed analysis, watershed restoration, Key Watersheds, Riparian Reserves). The Northwest Forest Plan and Aquatic Conservation Strategy require consideration of natural disturbances in land management decisions. The events occurring since 1994 will be factored into the planning process at all scales as appropriate. The Proposed Action would not change the way the agencies respond to these events.

The Northwest Forest Plan provided an adaptive management approach to environmental conditions and events. The Northwest Forest Plan recognized that ecosystems are not static but are ever changing in response to conditions and events.